5-31-2019

Organic Chemistry I Drill (CHEM2210D)-Module 2- Sample B-Answer Key

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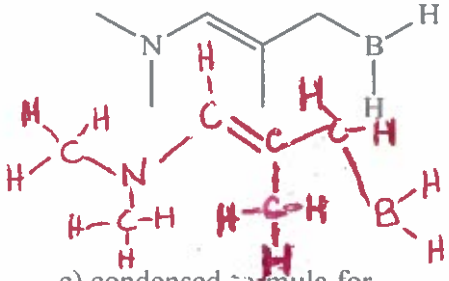
Name Key

Organic Chemistry 2210D

Second Drill Test (Sample B)
Answer All Questions

1. Draw structures as indicated.

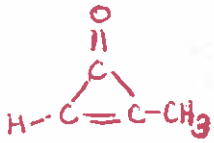
a) Lewis structure of

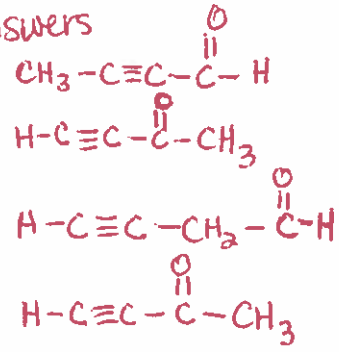


b) an isomer of many answers

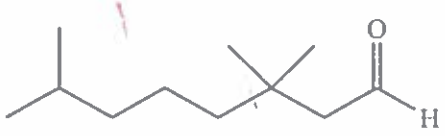
HDI = 3

C_4H_4O





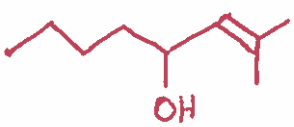
c) condensed formula for



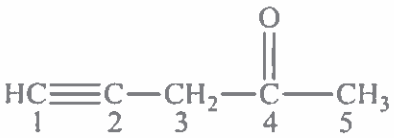
$(CH_3)_2CH(CH_2)_3C(CH_3)_2CH_2CHO$

d) a bond-line formula for

$CH_3(CH_2)_3CH(OH)CH{=}C(CH_3)_2$



2. Consider the molecule below. Give:



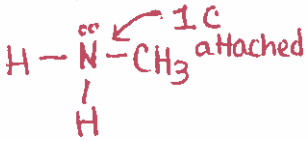
a) the hybridization of C2 SP

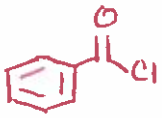
b) the hybridization of C4 SP^2

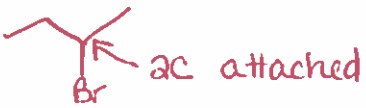
c) the O-C4-C5 bond angle 120°

3. Draw the structure of an example (**do not use R**) of each of the following classes of compounds. many possible answers

a) 1° amine b) acyl chloride c) ether d) 2° alkyl bromide

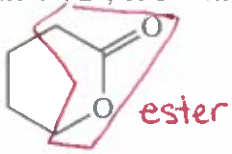






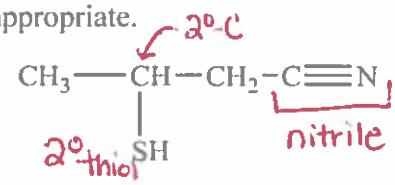
4. Name the functional group or groups present in each of the following molecules. Indicate 1°, 2°, or 3° when appropriate.

a)

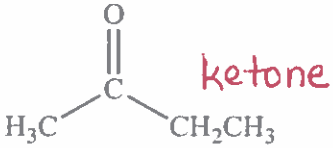


[cyclic ester = lactone]

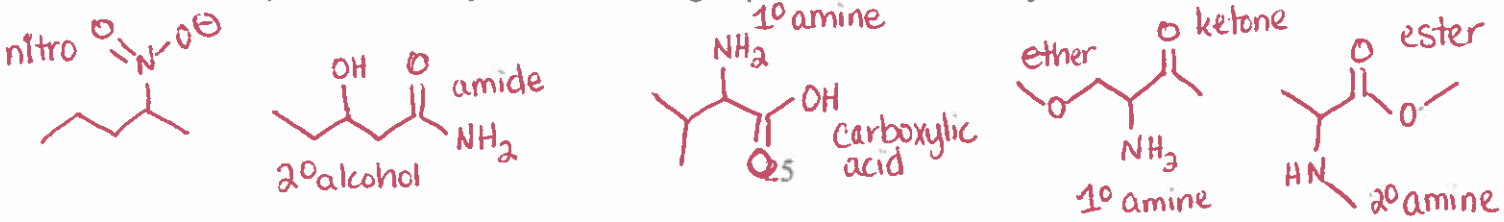
b)



c)



5. Draw at least four constitutional isomers of $C_5H_{11}NO_2$ with as many functional groups as possible. Identify each functional group. Some molecules may have more than one.



Multiple Choice

1. An oxygen-containing compound which shows no IR absorption at 1650-1800 cm^{-1} or 3200-3400 cm^{-1} is likely to be what type of compound?

NO C=O
NO OH

a) an amide (X has C=O)
b) an alcohol (X has O-H)
c) a ketone (X has C=O)
d) an ether

2. Which of these compounds has a band in its IR spectrum at 1650-1800 cm^{-1}? C=O

a) 
b) 
c) 
d) 

3. Which of the following compounds has the **highest** boiling point?

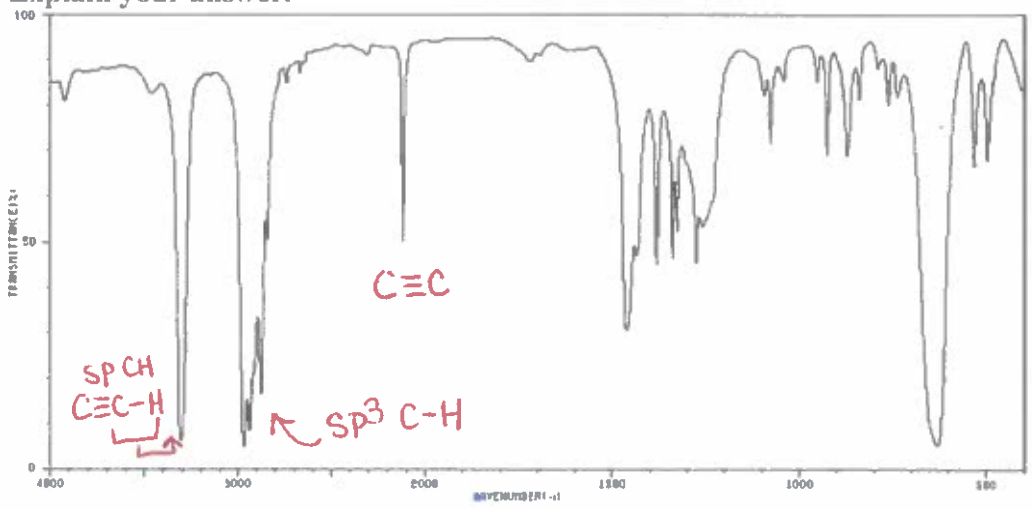
a) $CH_3CH_2CH_2CH_3$ (VDW only)
b) $CH_3CH_2CH_2CH_2CH_2OH$ (5C / H-bonds)
c) $CH_3OCH_2CH_3$ (↔ ⇄ dipoles)
d) $CH_3CH_2CH_2OH$ (3C / H-bonds)

4. Which of the following compounds is the **least soluble** in water?

a) $CH_3CH_2CH_2Br$ (3C, dipole)
b) $(CH_3)_2CHCH_2CH_2OH$ (5C, H-bonds)
c) $CH_3CH_2CH_2OH$ (3C, H-bonds)
d) $(CH_3)_2CHCH_2CH_2Br$ (5C, dipole)

More carbons:
- Less H_2O soluble
- Higher B.P.

5. Indicate which of the four compounds below is responsible for the IR spectrum shown below. **Explain your answer.**



a) $CH_3CH_2CH_2C{\equiv}CCH_3$
b) $CH_3CH_2CH_2CH_2OH$ (OH is broad not sharp)
c) $CH_3CH_2CH_2C{\equiv}CH$
d)